

A New Kind of Leader

Producing Engineers
with Public Policy Expertise

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Unraveling Clues to a National Tragedy

Clark Gift Revolutionizes
Undergraduate Engineering Education



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by John Stack

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Dear Alumni and Friends:

THE STEREOTYPICAL AMERICAN ENGINEER is not an inspiring figure. Though intelligent, highly focused and well paid, this white male pursues technology for its own sake, is satisfied to work quietly and alone under the direction of a business manager and is painfully introverted, uncommunicative and politically unaware or indifferent.

Like all stereotypes, this one provides minimal truth and maximal exaggeration. But as the popularity of the "Dilbert" cartoon character attests, it is a pervasive image, one that negatively influences society's perceptions of engineering, reduces students' interest in the field and thus limits engineering's ability to improve life.

Clark School engineers defy this stereotype. The school is located in close proximity to the nation's capital and to Maryland's, which tends to make faculty and students more aware of local, national and world events. As seen in the fall 2004 issue of *E@M*, the school has created innovative programs to help heighten awareness of engineering among prospective female and minority students and to offer opportunities and support as they pursue their studies.

Further, the Clark School has developed leading programs that help undergraduate students to explore the engineer's role in society; to work on projects of broad social interest in teams with non-engineering students; to obtain internships and co-op positions that provide work experience in corporations and government agencies; to plan and start their own technology-based companies; and to join in charitable engineering work here and abroad. Our excellent standard curriculum also involves students in real-world issues, such as the fire protection engineering class whose simulation of the World Trade Center fire is reported within these pages.

The next step in defying the "Dilbert" stereotype is to train engineers to participate directly in the policy-making process. The new master of engineering and public policy program described in this issue does just that. A joint offering of the Clark School and the university's School of Public Policy, this program will produce engineers highly engaged in the issues that confront the nation and the world today, from national security to the environment.

Such involvement will help change society's perceptions of engineers and thus bring more students into the profession. In the words of the American Society of Engineering Education's recent report on *Engineering Education and the National Interest*, "Aligning engineering, science, and technology with the services they render to society as a whole will do much to attract the best students for the best reasons."

The Clark School has yet another way to "attract the best students for the best reasons." As described in these pages, our wonderfully generous benefactor A. James Clark has recently created the \$30 million Clark Scholarship Endowment expressly to support undergraduate education. His vision and commitment stand in stark contrast to the "Dilbert" stereotype, and provide ample inspiration to all of us who care deeply about the Clark School and engineering.

Nariman Farvardin, *Professor and Dean*

New Center Enhances Maryland's Leadership in Nanotechnology

Nanotechnology's potential to produce new knowledge, products and careers has brought together the Clark School, the College of Computer, Mathematical and Physical Sciences and the College of Life Sciences in a new partnership. The Maryland Center for Integrated Nano Science and Engineering (M-CINSE, pronounced "M-since") enables the university to

contribute to nanoscience at the highest level, develop business and product ideas in nanotechnology and offer students cross-disciplinary preparation for nano-related careers.

"The center," explains Gary Rubloff, the center's founding director, professor of materials science and engineering and former director of the Institute for Systems Research, "emphasizes close integration of science and engineering to provide an optimum engine for technology and products, fundamental discovery and workforce development. It also enhances what is already a vital Maryland nano community by providing the infrastructure for greater coherence and effectiveness."

Operating within the Institute for Research in Electronics and Applied Physics, the center is the result of a long-term commitment by the deans of the three participating colleges. They recognize that this strategic partnership will enhance the intellectual and operational effectiveness of their respective disciplines in nanoscale research, in which cross-disciplinary

Gary Rubloff, pictured in his lab, is the founding director of the Maryland Center for Integrated Nano Science and Engineering.

collaborations are essential. The three colleges have already embarked on hiring 25 faculty members in the nano area to further strengthen the university's nano community.

Chief among the center's resources are facilities within the new Jeong H. Kim Engineering Building. State-of-the-art fabrication capabilities for creating micro- and nano-structures are available in its clean room environment (called the FabLab), while the laboratory for nanoscale imaging, spectroscopy and properties analysis (called the NispLab) provides corresponding facilities for characterizing materials and structures at the nanoscale. The new Laboratory for Combinatorial Nanosynthesis and Multiscale Characterization, recently funded by the Keck Foundation, offers yet another example of the pioneering research that extends campus strengths in combinatorial materials science.

Besides helping the campus nano commu-

nity to coordinate research and funding efforts, M-CINSE will promote nano education initiatives, technology and intellectual property development and partnerships in the industrial and international arenas. A major goal, Rubloff says, is "for M-CINSE to provide one-stop shopping to industry in Maryland, the region and the nation, so that industry can benefit from the university's excellence in nano and its close integration of science and technology in the field."

The university's nano community includes faculty with serious interests in technology transfer, commercialization and intellectual property. As further evidence of the university's growing leadership role in the field, the Clark School is engaging in a new partnership with the National Institute of Standards and Technology to promote nano manufacturing and metrology. (See related story, p.3.) ■

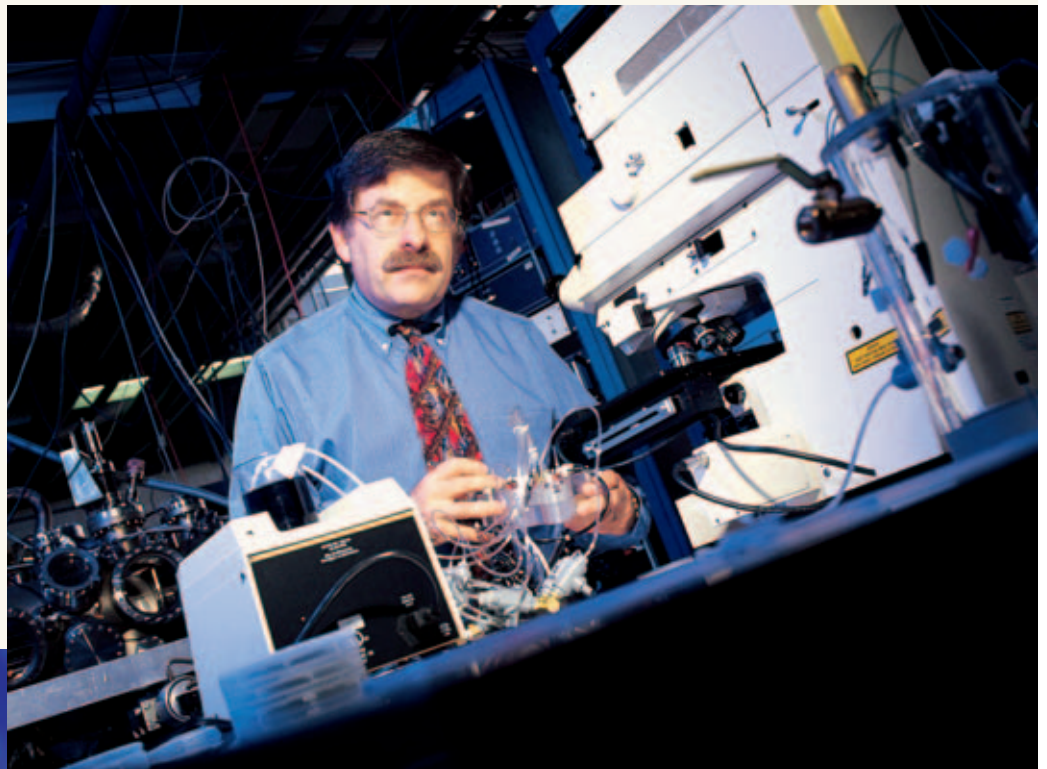


PHOTO BY JOHN T. CONSOLI

Clark School-NIST Partnership Promotes Nano Manufacturing

The Clark School, in cooperation with the National Institute of Standards and Technology (NIST), has established a Center for Nano Manufacturing and Metrology that will help to take nano products from the lab to the production line efficiently and economically. By enabling collaboration among Clark School, NIST and university researchers in physics, chemistry and the biological sciences, the center will lead to more rapid development of nano-based products and related economic opportunities.

The center will advance the science and technology of manufacturing using the unique properties achieved at the nanoscale. A vital part of nano manufacturing is metrology and as the world's leader in measurement science and the nation's foremost measurement laboratory, NIST is committed to applying staff

knowledge to problems at the nanoscale.

"The partnership with NIST gives the university access to physical resources, such as instrumentation, that will offer the school a competitive advantage in securing future nano projects as well as closer working relationships with NIST," says Michael Zachariah, professor of mechanical engineering and chemistry and director of the Clark School's Center for NanoEnergetics Research. He will serve as the center's coordinator.

The center capitalizes on the complementary interests and expertise of NIST and the university. Research proposals will be solicited from NIST and university faculty with a focus on developing the underlying foundation for affordable nano manufacturing. "To the extent that we can make the manufacture of nano products economically viable, we will be

making a significant contribution to accelerating the pace at which we see nanotechnology in our everyday world," says Zachariah.

Zachariah notes how a tremendous amount of university activity fostered the development of new information technology businesses in Silicon Valley decades ago. "Likewise, many companies interested in nano manufacturing prefer to work with experts," explains Zachariah. "The Clark School becomes even more attractive to start-ups and established companies ready to venture into this field."

"This center is one more step the university is taking to become a major nano player," he adds. "Through the center, we will train future nanotechnologists who will take their skills to businesses and industries throughout the region." ■

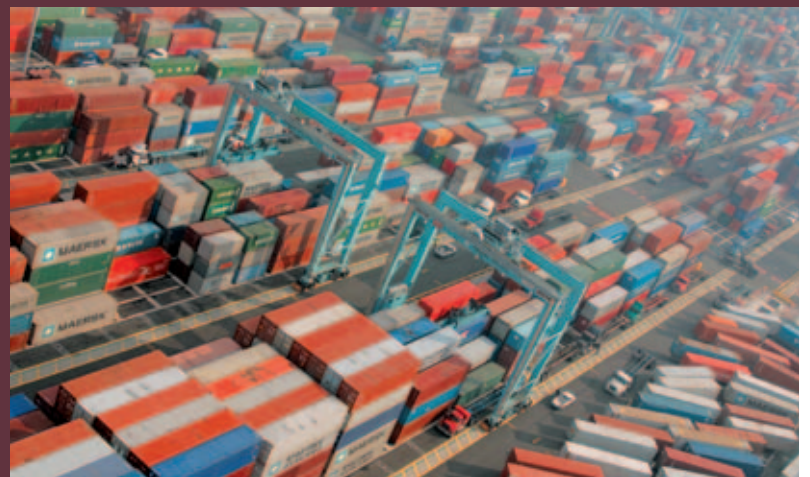
Reducing the Vulnerability of Freight Transport Systems

The Clark School leads a new, federally-funded research center designed to make freight transport more secure and efficient. The school was awarded \$700,000 to create the Center for Intermodal Freight Transportation Mobility and Security in collaboration with Rensselaer Polytechnic Institute.

Intermodal freight systems move containerized cargo using multiple transport modes—ships, trucks, trains and planes—and play a central role in the transport of \$7 trillion worth of freight carried annually by the U.S. transportation system. Because of its numerous transitions from mode to mode, intermodal shipping is especially vulnerable to disruptive activities. The new center develops new methods and technologies to reduce this vulnerability while improving the economics of intermodal freight systems.

The center focuses on the transport of goods in the Washington, D.C.-to-Boston corridor, but its research findings are expected to serve as a blueprint for the nation. Explains Hani Mahmassani, the Charles A. Irish, Sr. Chair in Civil and Environmental Engineering and center director, "In defining and proposing solutions for intermodal freight challenges in this densely populated area, the center will develop innovations and advanced technologies to improve intermodal facilities and logistics systems and processes across the country."

The center will be a component of the Maryland Transportation Initiative (MTI), also led by Mahmassani. MTI brings together campus-wide resources and activities to conduct leading-edge, cross-disciplinary studies of intelligent transportation systems and the transportation sector.



Current MTI research includes related efforts in freight tracking and logistics, evacuation planning models for the state of Minnesota and the Washington, D.C., area and real-time traffic system management during disasters for Houston and Maryland transportation systems.

As a natural outgrowth of these MTI projects, the new center will develop technology to integrate sensing and tracking data in models of freight distribution as a basis for real-time decisions, resulting in better transportation management. Advanced methods of urban traffic control also will be studied in conjunction with the needs of commercial vehicle traffic. ■

Martin Endowment Vital to Clark School Aerospace Research

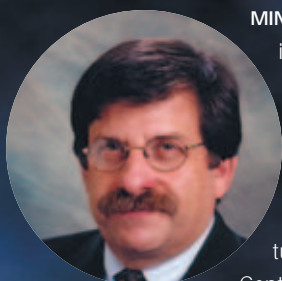
The Clark School has announced two Minta Martin Professorships to recognize outstanding senior faculty in aerospace research and education and affiliated fields. The professorships are funded through an endowment established by Glenn L. Martin in 1954 in honor of his mother, Minta. Some \$2.5 million was originally designated for the fund for aeronautical research, which has grown to become the single largest account in the university's endowment.



MINTA MARTIN PROFESSOR OF ENGINEERING J. GORDON LEISHMAN, aerospace engineering, is an internationally recognized specialist in rotorcraft aerodynamics whose work spans experimental, theoretical and numerical approaches. Previously, Leishman was a senior aerodynamicist for Westland Helicopters Ltd. in England, where he worked on the Lynx and EH-101 helicopter programs. He was involved in the British Experimental Rotorcraft Program (BERP), the outcomes of which resulted in a Westland Lynx helicopter breaking the world speed record in 1986.

He has authored more than 200 journal papers, conference papers and other technical reports on rotorcraft aerodynamics and topics in fluid mechanics. Leishman received a B.Sc., first class honors, a Ph.D. and a D.Sc (Eng.) in aeronautics and fluid mechanics and in aerospace engineering from the University of Glasgow.

Leishman is the author of the highly acclaimed textbook *Principles of Helicopter Aerodynamics* and is editor-in-chief of the *Journal of the American Helicopter Society*. He is an associate fellow of the American Institute of Aeronautics and Astronautics and a fellow of the Royal Aeronautical Society of Great Britain.



MINTA MARTIN PROFESSOR OF ENGINEERING GARY RUBLOFF is the founding director of the Maryland Center for Integrated Nano Science and Engineering. A professor in the Department of Materials Science and Engineering and the Institute for Systems Research (ISR), he previously served the Clark School as ISR director.

Rubloff spent two decades as a researcher and in research management in the physical sciences, silicon technology and manufacturing research departments at the IBM Thomas J. Watson Research Center, where he received six invention achievement awards. Before coming to Maryland, he was a professor in electrical engineering and associate director of the NSF Engineering Research Center for Advanced Electronic Materials Processing at North Carolina State University. He received his Ph.D. and M.S. in physics from The University of Chicago and his B.A. in physics, *magna cum laude*, from Dartmouth College.

He is a fellow of the AVS Science and Technology Society and the American Physical Society. In 2000, he received the AVS Gaede-Langmuir Prize for "inventive application of surface science and vacuum technology to the semiconductor industry and for fostering an effective bridge between AVS research and manufacturing." He has written more than 160 refereed publications and holds 19 patents. His current research interests include biomaterials and biomicrosystems, semiconductor materials and processes, semiconductor equipment design and process control for manufacturing and novel approaches to chemical diagnostics and materials science.

Hubbard Named UM Langley Professor

James Hubbard, Jr. has been named the University of Maryland Langley Professor at the National Institute of Aerospace (NIA), a non-profit research and graduate institute



near NASA's Langley Research Center. At NIA, Hubbard will work with Langley Professors from other universities, faculty of NIA schools, colleagues

at Maryland and Langley researchers to build a program in smart adaptive aero vehicles. He will become an integral part of the graduate education and research program at Langley, organizing and teaching a unique graduate educational opportunity in morphing aircraft and participating in outreach programs at the kindergarten to high school level.

Hubbard received his B.S., M.S. and Ph.D. in mechanical engineering from the Massachusetts Institute of Technology. He joins the Clark School from iProvia, a company that provides low-cost, portable and wireless products used by non-acute care facilities to continuously monitor patients' activities and vital signs. As co-founder and chief technology officer of the firm, he was responsible for product development, transition to manufacturing and off-site beta testing as well as corporate strategic planning and execution. He has held research positions at the Charles Stark Draper Laboratory, Optron Systems, Inc., Boston University and PhotoSense, Inc. He has received the Black Engineer of the Year President's Award; the International Society for Optical Engineering Smart Structures Product Innovation Award; four Charles Stark Draper Engineering Vice President's Annual Awards (for Best Technical Patent, Best Paper, Best Invention and Significant Patent); and the IBM Young Faculty Development Award. A fellow of the Vertical Flight Foundation, Hubbard was selected in 1984 as a NASA astronaut candidate.



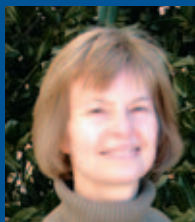
Milchberg Named Distinguished Scholar-Teacher

A Clark School Professor Is Honored for Third Straight Year

HOWARD MILCHBERG, who holds joint appointments in the Department of Electrical and Computer Engineering, the Institute for Physical Science and Technology and the Department of Physics, has been named a University Distinguished Scholar-Teacher. The award, which honors senior faculty who demonstrate outstanding scholarly achievement and teaching excellence, enables winners to share their expertise with the university at large. This marks the third year in a row in which a professor from the Clark School has received this honor.

Shared exploration defines Milchberg's teaching style. "Teaching forces me to re-examine my basis for understanding a subject," says Milchberg, who received a teaching certificate award from his department earlier in the fall. "I enjoy shining that spotlight on the material together with my students. One of my biggest satisfactions is participating in the evolution of an inexperienced graduate student into a full colleague."

Milchberg's research centers on the interaction of intense laser pulses with matter and the measurement of the ultra-fast, ultra-hot, ultra-dense processes that ensue, typically in novel plasmas. His work pertains to x-ray sources for advanced lithography and imaging, laser-based generation of relativistically accelerated particles and basic nonperturbative nonlinear physics.



Smela Receives Highest Honor for Young Researchers

ELISABETH SMELA, mechanical engineering, received the prestigious National Science Foundation Presidential Early Career Award for Scientists and Engineers (PECASE) for 2003 (presented in 2004). The award is the highest honor from the U.S. government for outstanding scientists and engineers who are in the early stages of promising research careers and have also displayed leadership in their fields.

Smela was recognized for research toward a new, microscopic "artificial muscle" or actuator technology in the field of micro-electro-mechanical systems (MEMS). This technology could lead to micro-robotic devices capable of walking, manipulating or flying. Smela was also honored for work with undergraduate and graduate students on their own MEMS research projects and for MEMS courses in which students design and build components of ant-like micro-robots.

GEORGE DIETER, professor emeritus of mechanical engineering and former dean of the Clark School, was presented the President's Medal, the highest honor bestowed on faculty members by the university, for his extraordinary contributions to the intellectual, social and cultural life of the university. Dieter served for 17 years as the dean of engineering, laying the foundation for the school's ascent into the top tier of engineering schools nationwide. He founded the Engineering Research Center (now the Maryland Technology Enterprise Institute or MTECH), the university's premier technology transfer organization, and served as president of the American Society of Engineering Education and the National Academy of Engineering.

President George W. Bush has appointed **ALI MOSLEH**, mechanical engineering, to the U.S. Nuclear Waste Technical Review Board. Mosleh has also been appointed director of the Clark School's reliability engineering program, administered through the mechanical engineering department.

MIN WU, electrical and computer engineering and Institute for Advanced Computer Studies, is among the world's 100 top young innovators, according to the Massachusetts Institute of Technology's *Technology Review* magazine, which named her to its "TR 100" list. The list includes 100 individuals under age 35 whose innovative work has made a profound impact on the world.

Fellows Honored

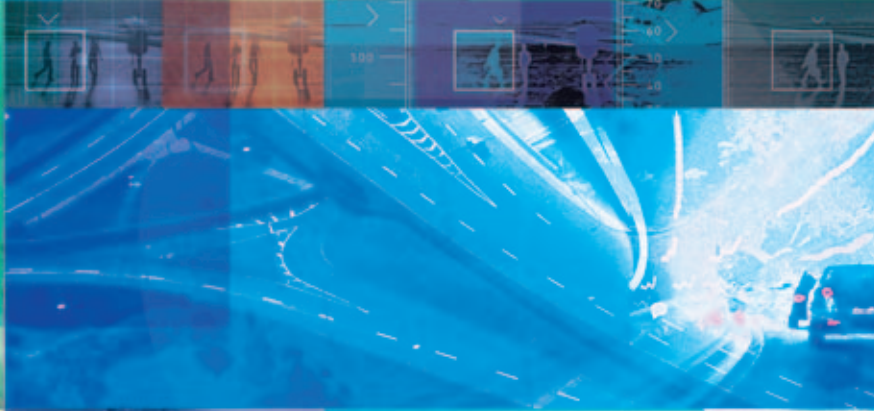
SHAPOUR AZARM, mechanical engineering, has been named a fellow of the American Society of Mechanical Engineers.

SHIHAB SHAMMA, electrical and computer engineering and Institute for Systems Research, was recently named a fellow of the Acoustical Society of America for contributions to computational modeling and cortical physiology of the mammalian auditory system.

J. GORDON LEISHMAN, aerospace engineering, was elected a fellow of the Royal Aeronautical Society for contributions to the theory and analysis of helicopter rotor aerodynamics.

LUZ MARTINEZ-MIRANDA, materials science and engineering, has been elected a fellow of the American Association for the Advancement of Science (AAAS) for her achievements in advancing science and education among women and under-represented minorities and for excellence in communicating the excitement of a research career to school children.

JOHN MELNGAILIS, electrical and computer engineering and Institute for Research in Engineering and Applied Physics, was named an Institute of Electrical and Electronics Engineers fellow. A pioneer in the application of focused ion beams, he has long been recognized as a key figure in ion beam technology from microelectronics applications to nanofabrication.






A New Kind of Leader

Producing Engineers with Public Policy Expertise


STORY BY JOHN STACK • ILLUSTRATION BY JASON QUICK

IN THE HALLS OF CONGRESS, IN FEDERAL, STATE AND MUNICIPAL AGENCIES, IN CORPORATE BOARDROOMS AND TOWN HALL MEETINGS, AMERICANS GATHER TO DISCUSS THE ISSUES THAT AFFECT THEIR LIVES, THEIR COMMUNITIES, THE NATION AND THE WORLD. BUT AS NEVER BEFORE, THE AVAILABILITY OF POWERFUL AND COMPLEX TECHNOLOGIES MAKES IT INCREASINGLY DIFFICULT FOR LEADERS TO COME TO INFORMED DECISIONS CONCERNING ENERGY, INFRASTRUCTURE, BIOTECHNOLOGY, NATIONAL SECURITY AND A HOST OF HIGH-STAKES ISSUES. ENGINEERS CAN CHANGE THIS SITUATION, AND THE A. JAMES CLARK SCHOOL OF ENGINEERING MAKES IT MORE LIKELY THEY WILL.



The Clark School has long offered its undergraduate students programs that explore the effects of technology in all aspects of life and the engineer's role in society. Now, through an innovative program offered jointly by the Clark School and the university's School of Public Policy, engineers can obtain specialized post-graduate training to become a new kind of leader: an engineer prepared to initiate and direct public policy discussions, build consensus and help make more informed policy decisions.

TWO DISCIPLINES, ONE VISION



Even before the new master of engineering and public policy (MEPP) program was formally approved in December 2004, potential applicants began inquiring about the program. "Clearly, there is a pent-up demand for studies in this area,"

affirms Matthias Ruth, Roy F. Weston Chair in Natural Economics at the School of Public Policy and MEPP co-director. "Already we have received letters and calls from individuals in all branches of engineering from across the United States and from Europe and Latin America as well."

Ruth and Deborah Goodings, professor of geotechnical engineering in the Department of Civil and Environmental Engineering at the Clark School and MEPP co-director, have talked for years about the urgent need for engineers to understand the social implications of their work and to participate in the political processes that affect it. Goodings explains, "Students are immersed in engineering theory and design, but typically at the expense of understanding the larger influences of, and on, their work. On the

other hand, those who lead in public policy typically have very limited technical or engineering backgrounds.”

Goodings acknowledges that virtually every day policy decisions are made that both require and affect engineering. “Engineers face long-term questions about smart growth and difficult choices regarding our environment, our infrastructure and our transportation needs,” she notes. “Internationally, there are especially daunting questions that need to be answered—and soon—concerning how we will develop infrastructure and how we will deal responsibly with finite natural resources.”

Yet, Goodings attests, “In areas in which their expertise is essential, engineers have not been involved to anywhere near the extent they should.” Particularly, engineers must consider the needs and aspirations of the world’s five billion “have-nots” as they develop solutions that could have significant ramifications for political stability, according to Goodings.

ENGINEERS ON CAPITOL HILL

MEPP students, with guidance from advisors and the program co-directors, will gain practical experience in their areas of special interest, working directly with government policymakers as well as researchers and professionals at think tanks, nonprofit organizations and engineering and technology firms.

Students will also benefit from seminars and activities that engage leaders in public dialogue. This spring the program hosted a panel on engineering and energy policy, attracting some of the nation’s foremost experts: William Wulf, president of the National Academy of Engineering; Katherine Sierra, vice president for infrastructure at the World Bank; Curtis Bolton of the Department of Energy’s Fusion Energy Sciences; and Michael Ramage, chair of the National Research Council report on “The Hydrogen Economy” and a former executive vice president with ExxonMobil Research and Engineering Company.

Goodings is optimistic that the new program will give Clark School students a competitive edge. “Our program will be far more applied than many others. We are 15 minutes from Capitol Hill, where so much that determines our world’s future takes place. Our students will learn in that environment and bring their influence to bear far beyond it,” she predicts.

8

CHOOSE YOUR POLICY SPECIALIZATION

MEPP admits current students or working engineers who have earned bachelor’s degrees in engineering or closely aligned disciplines and meet the high admission requirements of both the Clark School and the School of Public Policy. Students choose from seven areas of specialization:

- Energy policy
- Environmental policy
- Infrastructure policy
- Development policy
- National security policy
- Biotechnology policy
- Manufacturing policy

Students work directly with professionals at the intersection of public policy and engineering in the Washington, D.C., area.



Master of Engineering and Public Policy Program Co-directors Deborah Goodings (Clark School) and Matthias Ruth (School of Public Policy)

THE CLARK SCHOOL LEADS THE WAY

Producing engineers aware of their responsibilities to society is a defining attribute of the Clark School, with its long history of multidisciplinary and applied programs promoting student research, team projects, internships and entrepreneurship.

For example, the Science, Technology and Society Program within the College Park Scholars Program (see p.10) exposes undergraduate engineering students to problem solving within a social and political context. James Duncan, who heads the program, is unequivocally enthusiastic about MEPP as a graduate-level complement to his own. "Today, you get a degree in engineering and you are very excited about the science of it, about doing things," he notes. "You don't think a lot about the big picture. This program fills that void in forcing you to look at the big picture."

His comments reflect the thinking of the American Society of Civil Engineers. Concerned that tomorrow's engineers will need far greater preparation and study, the society examined the body of knowledge engineers will need for the 21st century. It identified 15 areas essential to an engineer's background, including what the MEPP program seeks to provide: "the broad education necessary to understand the impact of engineering solutions in a global and societal context, as well as an understanding of business and public policy, and administration fundamentals." ■

John Stack is a Baltimore-based writer who has written extensively for the American Society of Civil Engineers, headquartered in Reston, Va. In addition, his work has appeared in The Baltimore Sun, The Richmond Times-Dispatch, Baltimore magazine and other publications.

Programs Engage Clark School Students in the Wider World

ENGINEERS WITHOUT BORDERS (EWB)

Five Clark School students and EWB Faculty Advisor and MEPP Co-director Deborah Goodings traveled to Thailand last summer to build a health clinic serving Lisu Hill Tribe villages near the Burmese border. They were members of the Clark School chapter of Engineers Without Borders, a nonprofit organization that assists developing communities worldwide. The chapter received the 2004 EWB Collaboration Award for its work with Columbia University and University of California, Los Angeles students on the project. New projects are under development on the Pine Ridge Native American Reservation in South Dakota; in Patadel, Ecuador; in Baan Bo Mai, Thailand; and in Egypt.



SOLAR DECATHLON

To prove that solar energy is feasible today, Clark School students build a solar house in this 10-part international competition sponsored primarily by the U.S. Department of Energy. The Maryland team was one of 14 finalists selected to display its solar house and placed first in the design of the heating and energy balance system in the most recent Solar Decathlon in 2002. (See related story, p.20)



AMERICAN HELICOPTER SOCIETY STUDENT DESIGN COMPETITION

Students from the Clark School's Alfred Gessow Rotorcraft Center have taken first place seven years running in this annual competition to promote design innovation in the vertical flight industry. (See related story, p.19)

NASA RASC-AL COMPETITION

Clark School aerospace engineering students placed first in the NASA Lunar and Planetary Revolutionary Aerospace Systems Concepts-Academic Linkage (RASC-AL) competition for the design of a Space Construction and Orbital Utility Transport. The project involved a detailed design and assessment of closed-cabin atmospheric systems for extravehicular operations.



MARYLAND ENVIRONMENTAL DESIGN COMPETITION

Mechanical engineering students and faculty were involved in two teams that won a design competition to create an environmentally friendly welcome center in Frederick County, Maryland. The competition was sponsored by the Maryland Department of Transportation State Highway Administration and the office of Maryland Congressman Roscoe G. Bartlett.

INTRODUCING UNDERGRADUATES to the Possibilities of Leadership

AT THE CLARK SCHOOL, THE PROCESS OF EQUIPPING ENGINEERING STUDENTS TO MAKE SIGNIFICANT CONTRIBUTIONS TO SOCIETY BEGINS THE MOMENT THEY STEP ONTO CAMPUS. NOWHERE IS THIS MORE APPARENT THAN IN THE UNIVERSITY'S MOST SELECTIVE PROGRAMS FOR UNDERGRADUATES, INCLUDING THE COLLEGE PARK SCHOLARS, ITS ACCOMPANYING CERTIFICATE PROGRAM AND THE GEMSTONE PROGRAM.

Scholars Program Broadens Perspectives

James Duncan, professor of mechanical engineering, heads the Science, Technology and Society Program of the College Park Scholars. "Fifty percent of the students in this program major in engineering," he explains, "yet pre-med, math and science students also participate, bringing different and welcome perspectives about the world. Students come to understand firsthand that areas they perceived as exclusively the domain of engineering often have to be examined from economic, cultural, public health and public policy standpoints as well."

Students can become College Park Scholars during their freshman and sophomore years, choosing from one of 12 interdisciplinary programs focused on specific concentrations or themes. College Park Scholars take classes together and participate in specially designed courses and experiences that relate to their chosen areas.

Throughout the program, students hear directly from professionals about the most pressing issues in the field. "Speakers from government, industry groups and even the medical profession visit our classes and address a variety of subjects, such as nuclear power, genetically modified organisms, the health of the Chesapeake Bay and alternatives to fossil fuels," Duncan offers.

Some students move directly from the College Park Scholars to the Science, Technology and Society (STS) Certificate Program. Offered during the junior and senior years, the interdisciplinary core curriculum provides introductory as well as advanced study of the foundations of science and technology from the social, political, institutional, historical and intellectual perspectives. The program also includes a regular colloquium and an internship that emphasizes experiential learning.

Jennifer Lamos, B.S. '07, biological resources, interned at American Technology Corporation, a leading firm in engineering technology components for the federal government, as part of her STS Certificate Program experience. "I worked with fellow engineers constructing computer motherboards and learning the standards for complying with government regulations," recalls Lamos. "I also was encouraged to research current engineering projects such as advancements in prosthetics and biomedical

engineering." Her research led to a major paper on the history and future of bionics and ultimately led Lamos to change her major within the Clark School to match her growing interest in the field of prosthetics.

Multidisciplinary, Team-Based Gemstone Research

High-achieving applicants may qualify for the rigorous, invitation-only Gemstone program, which matriculates some 180 students each year from many disciplines throughout the university. Now in its ninth year, Gemstone was broadly conceived in response to employer demand for engineering students with experience working in teams and in multidisciplinary environments, according to James Wallace, program director and professor of mechanical engineering.

The program integrates technological and social issues into multi-year team research projects guided by a faculty mentor, who is dedicated to projects throughout students' course of study. "Some of the students in a team may focus mainly on the social, political or economic aspects of this inter-relationship between science, technology and the world around us. Others may focus mainly on the technology," shares Wallace.

Gemstone teams have addressed a number of critical research areas in recent years, including: a prioritizing model now used by the Maryland Department of Natural Resources to address fish spawning blockages in the Patuxent River drainage basin; a study on the rehabilitation of non-violent drug offenders that a Gemstone team presented at the American Society of Criminology Annual Conference in 2002; and the creation of a low-cost lab kit and manual to teach genetic engineering to high school students. Wallace cites a recent project for which students developed software to provide a detailed assessment of the needs and corresponding resources of high-density, depressed urban neighborhoods. The software was later shared with a neighborhood association.

Kate Nicholson, B.S. '01, sociology, knows firsthand the long-term advantages of Gemstone participation. A graduate student in urban planning who previously worked with a firm that consulted on housing issues, Nicholson recalls her team research project focused on the Langley Park, Md., community. "It was rewarding to work as a team to look at the social issue of crime, including open areas and safety, in the community. In presenting our findings, I was able to integrate my survey research with the digital mapping provided by engineering and computer science majors on my team." Nicholson adds, "Gemstone exposed me to the topic of housing and community development, which is an enormous and multifaceted issue." ■





UNRAVELING CLUES TO A NATIONAL TRAGEDY

Undergraduates Build and Burn
World Trade Center Model



As inquiries into the catastrophic World Trade Center (WTC) fire of September 11, 2001, continue, Clark School undergraduates have launched their own investigation.

Late last fall some 45 students simulated the fire on the 96th floor of the North Tower, where one of the hijacked jets struck, by constructing and setting ablaze a 1/20th scale model of the floor at a special test facility. They plan to complete their analysis in the next few weeks.

The simulation was the brainchild of Professor of Fire Protection Engineering Andre Marshall, Ph.D. '96, mechanical engineering, and Professor James Quintiere, who holds the John L. Bryan Chair in Fire Protection Engineering. Together, they team-taught the students' Assessment Methods and Laboratory course last semester.

"We wanted to challenge students outside of the normal lab venue and they jumped at this idea,"

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relates Quintiere, a former chief of the Fire Science and Engineering Division of the National Institute of Standards and Technology (NIST).

BUILDING THE MODEL

Of the nine project teams, five focused on designing the model to produce fire behavior similar to what occurred in the WTC. Drawing on faculty connections within the WTC "family," students contacted vendors and suppliers, such as furniture distributors, and obtained detailed drawings of the layout of the 96th floor to ensure the most realistic reconstruction possible. NIST and the Federal Emergency Management Agency also provided information. "Students researched various building characteristics and, in some cases, identified materials to generate the same thermal response as the original materials used in the WTC," shares Quintiere. The remaining four teams focused on the design and placement of instrumentation for assessing the fire dynamics within the model, including video within the burning compartment and temperature, heat flux and smoke measurements.

Evaluation of the fire simulation was designed to be virtually foolproof with back-up measurements constructed for all aspects of the fire. For instance, Quintiere notes, a laser was initially used to



Fire protection engineering students construct a 1/20th scale model of the 96th floor of the North Tower of the World Trade Center.

measure smoke produced by the fire, but when the laser beam failed, a vacuum cleaner was used to collect smoke on a filter that could then be measured. "Fire investigation is a big part of this field and helps us determine what causes a fire and what fire protection systems can be put in place. Models can help us construct specific fire scenarios and observe fire phenomena," describes Marshall, formerly a senior project engineer in combustion technology acquisition for the Rolls-Royce Corporation.



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Fire behavior was assessed through a variety of student-designed and -constructed instruments, including smoke obscuration devices (left corner, laser beam on a tripod and smoke induction pipe), a load cell for burning rate measurements (bottom, electronic strain gauge beam) and interior temperature and heat flux probes.

RE-ENACTING THE FIRE

As the state's comprehensive training and education system for emergency services, the university's Maryland Fire and Rescue Institute (MFRI) provided the perfect setting for the simulation. Students held a briefing for invited guests from the university, government agencies and industry prior to the actual demonstration. Marty LePore, MFRI training specialist, coordinated the fire simulation, providing a safe site, protective equipment and logistical support.

Jesse Hubert, B.S. '06, fire engineering, was among those students excited to work on a project that "could make a difference." Hubert, a member of the jet fuel group, shares, "We had to look at the amount of jet fuel dispersed, how it was dispersed, the effect of the fuel on the fire and how long the fire lasted.

PRIZE-WINNING AUTHOR SHARES HIS VIEWS



Pulitzer Prize-winning *New York Times* correspondent Eric Lipton shared his insights about the World Trade Center at the Clark School last fall. Lipton has written extensively about the World Trade Center and the mysteries that endure about the buildings' collapse. He is co-author with James Glanz of *City in the Sky: The Rise and Fall of the World Trade Center* (Henry Holt and Company, Incorporated, 2004).

A heavily insulated scaled truss section, ash remains of the wood fuel and the absence of soot on interior surfaces indicate extremely high temperatures (reaching 1000 degrees centigrade) were achieved in the simulated fire.



We used kerosene, which has many of the same properties of jet fuel, and mixed it with heptane to speed the burning. Then, we had to scale the fuel amount and decide how to best load it on to the model.”

Marshall confirms that student enthusiasm was high because “they were able to work on a problem of significant engineering relevance.”

“Many things came together on this project. Students designed and constructed the floor model, built the measurement tools and performed the analyses. At the same time, they felt they were making contributions to society,” agrees Quintiere.

VALIDATING THE EXPERIENCE

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Kenneth D. Steckler, engineering section chief for the Bureau of Alcohol, Tobacco, Firearms and Explosives ATF Fire Research Laboratory, observed the simulation and attests to the value of hands-on experiences for young engineers. “These students have learned the importance of hard work and of resolving their difficulties through the application of scientific principles as well as trial and error. This is a great way to apply classroom learning to

“This is a great way to apply classroom learning to real-world problems.”

Kenneth D. Steckler
Engineering Section Chief
Bureau of Alcohol, Tobacco, Firearms and Explosives
ATF Fire Research Laboratory

real-world problems,” he says. Steckler, who works with a staff composed primarily of Clark School graduates, notes, “With our labs located right down the road, we are lucky to have access to a talented pool of students and faculty.”

“This type of work is important in preventing future catastrophes,” confirms LePore. “It can provide important information for improving structures without current fire protection systems and enhancing fire protection for new structures.”

Though the data from the burn is still under analysis, Marshall and Quintiere are hoping to publish the results in an engineering education journal later this spring. Quintiere points out, “One area in which there appears to be a gap between current thinking and the model simulation is the amount of solid fuel—the contents of the offices—dispersed on the 96th floor. NIST investigators have factored in a lower fuel content than we did in our model and we have reason to suspect a higher amount of fuel might have been dispersed.” ■



ONE OF A KIND

The Clark School offers the nation's only accredited undergraduate program and one of only two graduate programs in fire protection engineering in the United States. Clark School graduates have played vital roles in formulating fire-related codes, regulations and standards in use throughout the nation and the world. In 2004, the department's faculty and students were involved with nearly 40 research projects, ranging from human behavior in fires to the auto-ignition of wood and advanced fire detection methods. In partnership with NASA, the department is working to enhance fire safety aboard the Space Shuttle and the International Space Station.

Business Plan Winners Move Toward the Market

New business ventures with Clark School ties captured the \$15,000 top prizes in the university's 2004 Business Plan Competition (now titled Venture Challenge) and are readying their technology-based products for the commercial market. MacroPhage Networks, Inc. offers solutions for protecting Internet networks and Data & Information Solutions Corporation uses a patent-pending technology to retrieve previously unrecoverable computer information.

MacroPhage Networks, Inc.

Led by Mehdi Kalantari, electrical and computer engineering (ECE) Ph.D. candidate, MacroPhage secured first prize in the graduate category. The MacroPhage team has developed a patent-pending technology that mimics the human immune system to protect Internet networks from the 4,000-plus Distributed Denial of Service (DDoS) attacks that occur each week.

"For malicious reasons, for entertainment, for political purposes, or for other reasons, hackers launch a piece of code, known as a worm or virus, to target

particular servers," explains Kalantari, whose team members include Mark Shayman, ECE professor, and Mehdi Alasti, ECE research associate. "These attacks can cause real harm to the server and affect millions of users," adds Kalantari. "Smaller companies and e-commerce companies are especially vulnerable." The 30-year-old Kalantari received his B.S. and M.S. in engineering from Sharif University of Technology in Iran. To continue his education at the Clark School, he left a successful start-up company in Iran that developed process controls for manufacturing production lines.

Mehdi Kalantari



PHOTOS BY JOHN T. CONSOLI

The MacroPhage technology, based on complex algorithms, can be deployed as software installed in network gateways and firewalls, or through complete, stand-alone independent mechanisms to filter electronic traffic, explains Kalantari. The Maryland Technology Development Corporation (TEDCO) has granted a \$50,000 award to the company to further develop the technology and implement its prototype.

Data & Information Solutions Corporation

In the alumni category, Maryland Data Recovery, headed by Chun Tse, B.S. '97, M.S. '02, Ph.D. '03 and ECE research associate, earned the first-place prize. Now known as Data & Information Solutions Corporation (DISC), the company uses patent-pending "spin-stand imaging" and data unscrambling technologies to recover previously unrecoverable computer information from hard disks. DISC was co-founded by Isaak Mayergoyz, professor of ECE and the Institute for Advanced Computer Studies and a renowned authority in magnetics.

The data recovery market, estimated to exceed \$500 million annually, is growing. Yet some 30 percent of failed hard drives cannot be recovered by existing data recovery technology. The spin-stand technology has proven to be very useful in the data recovery process. "This drive-independent data recovery technology can recover hard disk data that currently cannot be recovered," shares Mayergoyz.

"We foresee the product having potential in three sectors: in commercial data

Chun Tse (seated) with Isaak Mayergoyz

recovery for individual businesses, including lawyers and physicians who rely on extensive personal data collections; in innovative data backup applications; and in forensic data recovery and intelligence," offers Tse.

Launched in 2000, the business plan competition is managed by the Clark School's Hinman Campus Entrepreneurship Opportunities (CEOs) program, the nation's first living-learning undergraduate entrepreneurship program. "Winning the business plan competition has helped us realize the commercial potential of this technology and helped us better organize and understand certain aspects of a start-up business," says Mayergoyz. "We are moving forward with commercialization, but we recognize additional research is needed as we continue to develop the technology." ■



Web Publishing Company Launched by Hinman CEOs Student

ANTHONY CASALENA, B.S. '05, computer science, and a member of the Hinman CEOs program, garnered first prize in the undergraduate category of the 2004 Business Plan Competition. His company, Squarespace, makes an intelligent Internet content management system that Casalena believes is the next evolution of publishing on the World Wide Web.

Launched in December 2003, Squarespace has already attracted political columnists, athlete fan site operators, large organizations, small businesses, students and home bloggers. Users can log onto their web sites and configure files with just a simple web-based browser, eliminating the need for HTML editors or file transfer protocol software. This fall, Squarespace was featured in a weekly start-up profile in *The Washington Post*.

Clark Gift Revolutionizes Undergraduate Engineering Education



PHOTOS BY JOHN T. CONSOLI

At the endowment announcement in Annapolis: (left to right) University of Maryland President C. D. Mote, Jr., A. James Clark, Clark School Dean Nariman Farvardin and John M. Brophy '71, chair of the Executive Committee of the Board of Trustees of the University of Maryland College Park Foundation, Inc.

vide financial support for untold numbers of undergraduate engineering students, with immediate and long-term benefits for the school and the nation's engineering profession.

The new endowment is the single largest gift in the

finest students to the Clark School."

The new endowment stands to enrich the Clark School's undergraduate experience in a number of ways, including reducing or eliminating financial barriers for greater numbers of students; attracting more top students by offering financial packages competitive with other leading schools; and inspiring and motivating minority and other students who might not previously have considered engineering. In the process, the endowment will help to end the nation's shortage of highly trained engineers.

Just days after celebrating the new endowment, Clark was honored with the highest professional distinction accorded an engineer: election to the National Academy of Engineering. The academy recognized Clark "for the development of project controls and construction equipment, the creation of a major construction

Benefactor Elected to National Academy of Engineering

A. James Clark, '50, chairman and chief executive officer of Clark Enterprises, Inc., and the man for whom the Clark School is named, has affirmed his commitment to the school in an unprecedented way. Through the establishment of the new \$30 million A. James Clark Scholarship Endowment, Clark will pro-

school's history—doubling Clark's 1994 donation, which was the largest until now (and which moved the school to adopt the Clark name). "What we are seeing today is an unbelievable transformation in the excellence of education and the quality of the student body at the Clark School," notes Clark. "These scholarships will help many potential engineers who could not afford an education and will attract many of the nation's

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Two New Ways to Show Your Support



As the school creates new programs and facilities to help lead today's scientific and technological advances and train new engineers, friends and graduates of the Clark School have two new ways to show their support.

The Clark School's Annual Giving Leadership Task Force has created a new organization to stimulate and recognize annual gifts from current and prospective

donors. The **CLARK ENGINEERS SOCIETY** features four giving levels starting at \$1,000 per year. Channeled directly to the Clark School, gifts to the society may support a named scholarship or the work of a

specific department or faculty member, or be used by Dean Nariman Farvardin to fund top priorities.

The **DEAN'S CIRCLE** is a group of men and women from all over the world who are committed to participating in the work of the Clark School at the very highest level. Interacting regularly with the dean and the school's leadership to accelerate the school's progress, Dean's Circle members formalize their commitment to the school's future by giving generously of their financial, intellectual and social resources. ■

For more information about joining the Clark Engineers Society and the Dean's Circle, contact Radka Z. Nebesky, assistant director of development, 301.405.8072, radka@umd.edu.



Benefactors A. James Clark, left, and Robert H. Smith will serve as co-chairs of the leadership phase of the university's upcoming capital campaign.

firm and support for engineering education." That firm, Clark Construction, has built some of the most visible architectural landmarks in the country, including the nearly completed Jeong H. Kim Engineering Building (see sidebar this page and article on back cover).

Clark attended Maryland on a state scholarship, paying only for his books, and says that his experiences inspired a lifelong commitment to the university. In addition to his 1994 and 2005 gifts to the Clark School, he has endowed a chair in the graduate program in construction engineering and management. He is a former member of the University of Maryland Board of Regents and the board of directors of the University of Maryland Foundation. He currently serves on the University of Maryland College Park Foundation Executive Committee. The university has honored him with an honorary doctor of engineering degree and the Distinguished Engineering Alumnus Award.

The Clark gift was announced along with a \$30 million gift from Robert H. Smith, a strong supporter of the business school, the performing arts center and other university programs. The two benefactors will serve as co-chairs of the leadership phase of the university's upcoming capital campaign, which will be publicly launched in fall 2006. ■



Interior of Kim Building rotunda

Add Your Name as a Kim Building Sponsor

As completion nears for the Jeong H. Kim Engineering Building, one of the most sophisticated engineering research and educational facilities in the nation, the list of individual and corporate sponsors grows. Recently, BAE Systems North America agreed to contribute generously over the next five years as a Kim Building sponsor. BAE Systems is one of the country's foremost national security, aerospace and information systems companies.

"The Clark School is future-focused," says Robert T. Murphy, president of the BAE Systems Technology Solutions Sector. "More so than at many schools, their students and faculty are developing the technologies that will be important next year and five years from now. That's why BAE Systems has decided to support the Kim Building, where so much exciting work will take place."

Sony USA Foundation, Inc., also recently committed to fund state-of-the-art audio and video equipment for the Kim Building's Sony Multimedia Theater and Studio. The equipment will help researchers record, digitize, save and analyze audio data.

For both individuals and organizations, naming opportunities remain at a variety of levels (from student lounges to seminar rooms to research laboratories) in such areas as smart systems, space engineering and bioengineering. For more information on how you can support the Kim Engineering Building, contact Cornelia Kennedy, director of alumni relations, 301.405.2150, ckennedy@umd.edu. ■

KIM BUILDING NAMED GIFTS (as of publication date)

GROUND FLOOR

- The Edwin W. Inglis '43 Thermal Fluids Instructional Laboratory
- The W. M. Keck Foundation Laboratory for Combinatorial Nanosynthesis and Multiscale Characterization
- The PEPCO Seminar Room
- The Richard and Rebecca Kay Board Room

SECOND FLOOR

- The Agere Systems Microelectronics Instructional Laboratory
- The BGE Learning Center in Honor of George V. McGowan '51
- The Black & Decker Learning Center
- The Comcast Multimedia Signal Processing Laboratory
- The Charles A. Irish, Sr. '52 Computer Laboratory
- The Lockheed Martin Lounge
- The Sony Multimedia Theater and Studio

THIRD FLOOR

- The BAE Systems North America Controls Instructional Laboratory
- The BAE Systems North America Aerie
- The Christopher A. Havener '80 Conference Room

“Engineering’s Nobel:” Satellite Pioneers Miller and Plummer Win 2005 Draper Prize



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Edward A. Miller, B.S. '50, mechanical engineering, above, and James W. Plummer, M.S. '53, electrical engineering, have received the 2005 Charles Stark Draper Prize from the National Academy of Engineering. The prize, one of the world's pre-eminent awards for engineering achievement and

sometimes referred to as “engineering’s Nobel,” recognizes the Clark School graduates for their pioneering work in the top-secret Corona Project. Miller and Plummer were among five members of the project honored with the award.

From 1959 to 1972, the Corona Project created the field of satellite surveillance, providing vital photographic information that permitted the United States to gauge the nuclear threat posed by the Soviet Union during the Cold War and to pursue more effective foreign policies. Plummer served as project manager and Miller as project engineer. Their team accomplished the first successful recovery of a man-made object from earth orbit. Miller shared his experiences with Clark School students, faculty and staff the day following the Draper Award presentation.

Miller previously received the Distinguished Civilian Service Decoration from the U. S. Army, the highest honor the Army confers on a civilian, for his service as assistant secretary of the U. S. Army for research and development during the Ford administration. Plummer served as undersecretary to the U. S. Air Force. ■

Computing Research Association Honors Jane Lin

Even in elementary school, Jane Lin, B.S. '04, electrical and computer engineering, was a star student in mathematics. In high school, she applied her love of math to computer science, excelling in every such course her high school had to offer. “Both my parents are computer scientists, so I guess it was just a natural choice for me,” says Lin.

Lin pursued her interest in computer science at the Clark School. Late last year her groundbreaking research on the behavior of solutions to the Boolean Satisfiability (SAT) problem was recognized by

the Computer Research Association, which selected her as a runner-up for its Outstanding Undergraduate Award. The award recognizes undergraduates who show outstanding potential in an area of computing research. In 2003, her work was recognized with the Best Project Award from the Maryland Engineering Research Internship Teams (MERIT) summer program.

“SAT is one of the most important problems in many fields such as theoretical computer science and artificial intelligence,” says Lin’s mentor Gang Qu, electrical

and computer engineering and the Institute for Advance Computer Studies. According to Qu, Lin’s main contribution is “developing software that automatically creates hard-to-solve SAT problem instances, something that many researchers have worked on with little success in the past decade.”

Lin did not realize the significance of her work at the onset, but she quickly felt the excitement of research. “When you are learning from a textbook, everything you learn is already known. When you are conducting research, you are going where no one has gone



before and you believe you will find something new.”

While she decides what area of graduate study to pursue, Lin is working at the consulting firm of Booz Allen Hamilton on an electronic surveillance project for the Federal Bureau of Investigation. ■

Leonard Wins MacArthur Foundation “Genius” Grant

Naomi Leonard, Ph.D. '94, electrical engineering, and professor of mechanical and aerospace engineering at Princeton University, was named one of 23 MacArthur Fellows for her work in underwater robotics research. The award, sponsored by the John D. and Catherine T. MacArthur Foundation, is a \$500,000 “no-strings-attached” grant that rewards originality, creativity and potential for continued achievement. It is often referred to as the “genius” grant.

Leonard was cited for her work in build-

ing multiple miniature, autonomous underwater vehicles that mimic the behavior of schooling fish. Underwater autonomous technology allows oceanographers to place measuring instruments in the right place at the right time to collect data essential for understanding the physical forces controlling ocean dynamics. The technology also holds promise for military applications.

As a student in 1992, Leonard authored a



book with William Levine, electrical and computer engineering, titled *Using MATLAB to Analyze and Design Control Systems*.

Leonard recently hired Fumin Zhang, Ph.D. '04, Institute for Systems Research, as a postdoctoral student. Last fall, Leonard was named the principal investigator for a Department of Defense Multidisciplinary University Research Initiative (MURI) Award for a study on optimal asset distribution for environmental assessment and forecasting, based on observations, adaptive sampling and numerical predictions. ■

Philip Merrill Presidential Scholar Commends Clark Faculty Mentoring



Erin Dreyer, B.S./M.S. '06, materials science and engineering, has been honored as a Philip Merrill Presidential Scholar. This selective new program recognizes both academic excellence and the important role of faculty mentors: as part of the honor, students identify faculty who have had an important role in mentoring their academic careers. Dreyer, above left, cited the assistance of Isabel Lloyd, right, materials science and engineering, who guided Dreyer in her research on new long-lasting, aesthetic materials for dental crowns.

“Isabel Lloyd, my boss as well my advisor and professor, saw my potential, and gave me the freedom and independ-

ence to explore, which was accompanied by great responsibility,” Dreyer wrote. “She has been an example to me that you can be a female engineer with a successful career, family and personal life.”

Dreyer is now working with Minta Martin Professor of Engineering Gary Rubloff, materials science and engineering and the Institute for Systems Research, on research to characterize microfluidic devices using atomic force microscopy and Raman spectroscopy. In addition to acquiring scientific expertise, Dreyer cites learning about teamwork, leadership and the thrill of discovery as key Clark School experiences. “I hope to make a positive impact on human lives through my research in biomaterials,” she shares.

Dreyer has served as president of the school's Materials Engineering Society chapter and as a Clark School Ambassador, leading information sessions and guided tours for prospective students, contacting admitted students and presenting at high schools. In 2004, she also received the Dinah Berman Memorial Award for highest academic average at the end of her sophomore year and the Morgan L. Williams Memorial Scholarship for Washington, D.C.-area materials engineering students. ■



Seventh Consecutive First Place for Rotorcraft Team

For the seventh straight year, the Clark School of Engineering captured first place in the 21st Student Design Competition, graduate category, sponsored by the American Helicopter Society. The competition, which challenges students to create a vertical lift aircraft that meets specified requirements, provides a practical exercise for engineering students at nationally accredited colleges and universities. The student-designed aircraft had to be certified for single-pilot, day/night operations with cruise speeds of at least 145 knots. ■



Solar Decathlon Team Sets Sights on September, Seeks Support



The Clark School's 2002 Solar Decathlon entry garnered fourth prize in the international competition.

Many people talk about the potential benefits of solar energy, but students from the university's architecture, biology, business, journalism, and engineering schools are joining forces to prove that solar power is feasible today.

The students are competing in the 2005 Solar Decathlon, a group of 10 challenges centered around the design and construction of a fully functional and habitable solar-powered house. They will pit their work against university teams from around the country, Canada and Europe. In the last decathlon, in fall 2002, Maryland's team placed fourth; this year's team hopes to do even better.

Rob Murray, B.S. '05, civil engineering, and Najahyia Chinchilla, M.S. '06,

architecture, are leading the effort. "This year we are approaching the project as a team from the very beginning," says Chinchilla. "Engineers and architects are working together and consulting with each other on problems and issues as we go through the process. It gives us all a broader perspective."

The team is focusing on comfortable, spacious rooms with an emphasis on "connect-

ing with the outdoors." They will build their home on campus, then transport it to a "solar village" on the National Mall in Washington, D.C., where their work will be judged by a panel of experts and open to an estimated crowd of more than 100,000 tourists from October 7 to 16.

The contest is sponsored by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, in partnership with other national organizations. But the Maryland team, like its competitors, must find its own sources of support (fully tax deductible to the extent allowed by law). To learn more about the program and how to become a sponsor, visit the team's web site at www.solarhouse.umd.edu. ■

Alumni Notes

JAMES S. BENSON, B.S. '62, civil engineering, has been named to the board of directors of Cytomedix, Inc., a biotechnology company specializing in processes and products derived from autologous platelet gel releasates.

SCOTT MCBROOM, B.S. '88, mechanical engineering, was honored for his development of the Southwest Research Institute's Rapid Automotive Performance Simulator (RAPTOR) software, co-developed with DaimlerChrysler. The software was cited by *R&D Magazine* as one of the 100 most significant technological achievements of 2003.

The dissertation of **MIGUEL FIGLIOZZI, PH.D. '04**, electrical and computer engineering, was honored by the Dissertation Prize Competition of the Transportation Science and Logistics Section of the Institute for Operations Research and the Management Sciences, the oldest and most prestigious international dissertation competition in transportation science.

DAVID H. GRAHAM, B.S. '82, aerospace engineering, was one of three engineers from Northrop Grumman selected to receive the American Institute of Aeronautics and Astronautics' 2004 Aircraft Design Award for demonstrating a method to reduce the intensity of sonic booms.

JOHN M. MILLER, B.S. '69, aerospace engineering, and **M.S. '74**, mechanical engineering, is the new director of the U.S. Army Research Laboratory. He had served as acting director of the lab since 2003.

ART WALL, B.S. '70, electrical and computer engineering, received the National Service Award from the National Association of Radio and Television Engineers for his contributions to the telecommunications industry throughout his career at the Federal Communications Commission. Wall designated the university to receive the \$1,000 scholarship associated with the award.

Undergraduate **REJI KARTHOLY, B.S. '06**, electrical and computer engineering, is the scholarship recipient.

In Memoriam

HOWARD FILBERT, B.S. '41, M.S. '53, mechanical engineering, died on October 11, 2004.

Filbert served as chief of the Weapons Mechanism Division of the U.S. Naval Ordnance Lab early in his career and retired from industry. He was a member of the American Society of Mechanical Engineering, the Maryland Society of Professional Engineers and the Naval Undersea Warfare Museum Foundation. He served on the board of directors of the American Defense Preparedness Association and was an associate fellow of the American Institute of Aeronautics and Astronautics. He served as chairman of the Greater University of Maryland Fund in 1966.

ENGINEERING THE FUTURE

Forward Thinking

During his senior year at the University of Maryland, two factors shaped Tom Crane's destiny. Up until that point Tom, B.S. '62, civil engineering, had worked multiple jobs to meet his education costs. Then he was awarded a scholarship established by a Baltimore homebuilder, allowing him to devote himself fully to his final year of coursework. He vowed that, someday when he was able, he too would come to the aid of students in financial need.

That same year, the student chapter of the American Society of Civil Engineers presented a program to engineering students about the U.S. Navy Civil Engineer Corps. Tom's interest was sparked. Following graduation, he became an officer in the Corps.

Tom's first duty station was Guam, where he assisted in rebuilding damaged naval facilities following a "super typhoon" on the island. His second assignment took him to Port Hueneme, Calif., where he met his wife, Barbara. For the next 28 years they traveled the world as his overseas military duties took them from Puerto Rico to the Philippines to Hawaii. During a tour in Antarctica he oversaw the first full decommissioning of a nuclear reactor.

Thirty-one years and a host of military decorations later, having become the second officer to command the re-established Southwest Division Naval Facilities Engineering Command in San Diego, Tom retired from the Navy as a captain in 1993. He quickly formed his own firm, assisting clients from engineering to construction firms in winning U. S. Navy contracts.

Not long after Tom started his business, the Cranes named the University of Maryland Foundation as a beneficiary in their will. As their success grew, it was Barbara's idea to actively fund the scholarship Tom had vowed to establish back in his senior year. Over the past four years, they have continued to increase the level of funding for the Thomas and Barbara Crane Scholarship in Civil Engineering and have raised their



planned contribution to the foundation.

"I received a terrific grounding at Maryland," confirms Tom. "The engineering school helped me learn to carefully define a problem, look at alternatives and devise a solution. For success in any career, these abilities are among the most important."

Today, the couple is giving back to their local community as well. Barbara has donated her time and energies to more than a dozen organizations and has logged more than 7,000 volunteer hours during her 12 years of service for Scripps Memorial Hospital in La Jolla, Calif. Tom provides pro bono consulting for the city of San Diego and serves as the executive director of the San Diego Chapter of American Military Engineers. He has been instrumental in developing a scholarship program at that organization.

In the years to come, the Cranes hope to create additional scholarships at the Clark School at increasingly higher award levels. "Providing students with access to a college education, especially in science and engineering, is important to the future of this country," says Tom. The couple is optimistic that scholarship recipients may, like Tom and Barbara, become interested in serving national needs and one day create their own scholarships for a new generation of engineers. ■

TO LEARN MORE ABOUT MAKING A PLANNED GIFT OR FUNDING A SCHOLARSHIP, PLEASE CALL OR WRITE:

Radka Z. Nebesky, assistant director of development, Clark School of Engineering, University of Maryland, College Park, Maryland 20742 ■ 301.405.8072 ■ radka@umd.edu



PHOTOS BY JOHN T. CONSOLI

Save This Date—9/19/05—for the Kim Building Dedication

Mark your calendars now for the September 19, 2005, dedication of the new Jeong H. Kim Engineering Building. Clark School faculty, staff, students, friends and members of the university community are invited to

tour the school's newest facility, view demonstrations in state-of-the-art research laboratories and participate in a variety of special programs. Look for your official invitation in the months ahead.



A. JAMES CLARK
SCHOOL OF ENGINEERING

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